The Diseases of the Grapevines.

are principally caused by animal or vegetable parasites. Of the former I leave others to give, who are more conversant with the subject, to treat, and will merely repeat here that our ~~western~~ species have all grown up with the phylloxera and would have long been extinguished if the insect had the power to do that — ~~that~~ they live ~~on~~ together ~~[illegible]~~ and there is an accommodation between them as well as the insect which has no other nourishment but our Grapevines. Only Vitis Labrusca seems to form a partial exception of which I have spoken pag. ....

More important for us in America are the fungous diseases of our grapevines, which do us more harm than the insect. It is said that in Europe they have discovered over 200 kinds of fungi which live on the different parts of vines, but fortunately only very few of them are injurious and these are for us principally the mildew of the leaves, Peronospora viticola and the black rot of the berries Phoma uvicola. In Europe they have the Oidium Tuckeri and the Anthracnose of the French (Sphaceloma ampelinum) besides the Mildew which has lately been introduced.

The Mildew is the frostlike white substance coating which shows itself on the under side of the vine leaves, having as well glabrous ones, here in Missouri generally in June, after the first sultry and ~~wet~~ humid weather ~~of that~~ usual at that season; in the eastern States it seems to come on later in June and in the fall; it sometimes also infests the petioles of the leaves the stems of the bunches and the very young berries. but even if it does not attack the latter the effect on the leaves alone ~~would~~ which turn brown in spots, and are partially or entirely completely killed, destroys the fruit, ~~and~~ the berries shriveling from the base & turning brown, without falling off. This is here often termed the brown rot. — The fungus at first ~~tissue~~ pervades the cellular tissue of the leaf, then, in a few days, the sporebearing ~~little~~ minute stems penetrate through the stomata (the breathing pores) of the lower surface, forming little erect branching organs, which might be compared to miniature pine trees which singly ~~[illegible]~~ are not visible to the naked eye,

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Fungi 2

Amid bear at the end of these branchlets the summer spores (conidia) which spontaneously spread and germinate within ~~a few days~~ at astonishing rapidity. Late in the season the fungus produces what is called the resting spores, (oospores) ~~bor~~ in the interior of the leaf; and while the ~~other~~ summer propagate the plant in summer, these keep it alive through winter and insure its growth in the following season. Thus it is seen that the dead leaves, containing the resting spores really do contain the germs of the following year, and these leaves ought to be destroyed, best carefully gathering and burning them or by deeply ~~digging~~ burying them in the ground. The direct destruction of the fungus has been often attempted, by different means, especially by sprinkling with sulphur, but without any effect; but a dry spell of weather ~~checks~~ prevents it most effectually for the time being. (undoubtedly imported with the Phylloxera from this country)

This fungus has since 1878 made its appearance in Europe and has added another terrible infliction on the wine growers, there, which threatens to be worse than the Oidium which years ago used to decimate the grape crops in Europe.

A few words about this Oidium may be in place here. ~~Botanists are in doubt about the original home of this plant parasite.~~ The oidium is a mildew like fungus which appears on the outside of the ~~upper~~ side of the leaves and bears its spores on smaller, not much branched stemlets, and destroys the leaf and with it the crop much like our ~~mildew~~ Peronospora does; but its resting spores ~~are unknown~~ and with its life history are not so well ~~known as of this~~ ascertained; but with sulphur sprinkled over the leaves will destroy it. It made its first appearance (to botanists at least) about 1845 in graperies at Margate ~~in~~ England, and spread rapidly and destructively over a great part of Europe and the islands (Madeira!) but seems to be now less common or less injurious. ~~Botanists have~~ It ~~has never been seen in this country, though repeatedly mentioned~~ Where it originally came from is unknown, though some suppose that it originated in America but in the form known in Europe it has never appeared here, whether in another form is quite doubtful — at all events we have no serious destructive vine mildew in this country.

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Phoma uvicola

The second great frequent ~~trouble~~ pest of our vineyards is the black rot. On the ~~side of the~~ berries, never on leaves or stems, generally when they are full grown, in July and August, very rarely on half grown berries in June a light brown spot is observed on the side, not near the stem; This spot spreads and darkens, shining nodules or pustules begin to protrude above the epidermis, at last the whole berry shrivels up, turning black and the pustules roughen the surface and each one giving in the perfect pustules emit a whitish mass, visible with the naked eye

561

which consists of the innumerable spores of twisted threadlike glued together by a mucilaginous coating. In this condition the spores are inert, but rain will dissolve the coating and liberate and wash down the spores, or they will come to the ground with the berries. What then whether they enter the soil ~~sink~~ and how they propagate the fungus ~~and~~ recurrence of the is as yet unknown at all events it seems proper to gather and destroy the affected berries, if such a thing can be done.

In Europe they have another ~~fungus~~ fungus disease of the grape, called in German Brenner, in France Anthracnose and described as Sphaceloma ampelinum, which by some authority has been supposed to be another form of development of the black rot described above, this ~~which~~, however seems very doubtful; we have as it seems never had the Sphaceloma nor they the Phoma. The Sphaceloma attacks all the green parts leaves young stems and green berries and forms upon wounds comparable to ulcers, while our Phoma attacks as far as known only the berries ~~and~~ and behaves as described above.

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V

grown than that Prof Buckley distinguished and named it. Unfortunately his description was not only vague but faulty, and only the no foreign botanist could recognize it, only those who could compare his specimens and the Texans who well knew the "Little Mountain Grape" ~~knew~~ understood that he meant. Buckley's mention of a ~~rather large~~ middle-sized green very palatable berry has induced French ~~vignerons~~ horticulturists nurserymen to look for his plant among the numerous forms of Labrusca with white fruit; and Prof Planchon therefore giving the name of our plant to V. Berlandieri. + ~~[illegible]~~ This ~~[illegible]~~ mutual errors are now corrected and the question only remains whether this southern species with its resistant roots will eventually prove an acquisition to the Cultivator. — The species will grow from cuttings. ~~easily~~ [illegible]

+ It is reported however that a form of it is not rare in the hills of Texas, e.g. near Fredericksburg, and also on the borders of the Llano estacado, bearing larger white berries, which then would account for Buckley's original description.

6 V. Ariz. is closely related to the last, and with similar seeds, but the flat raphe, though not prominent, is broad ~~and flat~~. + Young leaves ~~thinner woolly~~, older ones glabrate and very rigid and (rough) especially on the upper surface; It does not seem to climb high. — On the mountains of Arizona and Cañons extending to Southern New Mexico and western Texas. ~~[illegible]~~

+ leaves cordate, with a rather open rounded sinus, with 2 very short lateral lobes or not lobed. — Berries small or middle sized reported to be of a luscious taste.

7 Vitis rupestris

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V. monticola, Bu. (One of the smaller species peculiar to the hilly region
of the Cretaceous formation of Texas, not found in the ~~lower~~ Country
nor in the Granite or mountain region, common about San Antonio, New
Braunfels, Austin etc., also cultivated about San Antonio.)

Usually a small bushy vine, not rarely climbing over
higher trees; ~~tips~~ branchlet angled young leaves, petioles and stems, ~~[illegible]~~ floccose downy,
the down get lost disappearing except on the branchlets, there
remaining in floccose patches; stipules very short (½ line
long; leaves (rounded) deeply cordate with a ~~broad~~ rounded sinus,
very shortly 3 lobed with small but broad teeth; ~~[illegible]~~
rather wrinkled, but older ones on the lower surface becoming
glabrous and (especially in the herbarium) shining; usually
~~about~~ 3 inches across, only on vigorous shoots 4 or 5 inches wide;
tendrils intermittent, in the small bushy form often withering away;
bunches of ~~fruit~~ compact, short, berries about 4 or rarely 5
lines in diameter; seeds obtuse, emarginate, the chalaza with narrow,
but without a visible
extending upwards in a broad groove,

504

raphe.

see above   S. Antonio, where the bushes as well as the
berries become larger, ~~it seems to be confounded there with the~~
~~Mustang sp.~~ — The history of this plant is of interest, as it
has given rise to a great deal of controversy and speculation.
The Swiss Botanist Berlandier collected it
Buckley described it but it was not till ~~25~~ or 30
about 50 years ago × in west Texas I found the first time
× on his specimens ~~from near San Antonio~~ preserved in herbarium
of Phylloxera galls which are (evidently) proving the existence
of the Phylloxera by no one now doubted existence
of the insect in America long before it was known to
Science ~~or~~ in Europe, and proving also its existence so far
South in Texas.

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[illegible]

// A peculiar form of [illegible] or ~~possibly [illegible] [illegible] [illegible]~~ and ~~Repository~~ is a plant which I found 15 years ago in the Botanic Garden of Berlin under the name of Vitis Salonis and which has been lately [illegible] in France with the [illegible] as characteristic of that nation as [illegible] & [illegible] of [illegible] [illegible] for their [illegible] [illegible]. The leaves of this plant are scarcely 3-lobed, but characterized by the long and narrow almost incised teeth of the margin first 2 [illegible]. The name is perhaps a corruption of Longii; and this ~~[illegible]~~ [illegible] upon refers to the [illegible] [illegible] when Mr. Long in 1820 found such excellent grapes; seeds may have been obtained brought home and the plant named as Longii. In a manuscript of Bronner the viticulturist preserved in the Carlsruhe Library, ~~[illegible]~~ speaks of "Longii from [illegible]" is ~~the only [illegible] grape in the~~ [illegible] ~~[illegible]~~; [illegible] says that Longii is preserved in [illegible] garden at Wiesloch near Heidelberg and that it is identical with Salonis. As an example of curious speculation it may be stated that some viticulturists had interpreted Salonis as Janus, [illegible] and others as Caucasus.

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Hybridity among Grape vines

Plants which are so intimately related among themselves are apt to hybridize, and ~~they do it in such a way~~ their offspring is usually fertile, not like many hybrid animals (the mules) or plants not impossible to propagate. We have indeed a number of artificial hybrids among grape vines, which behave as well as the true species and their seeds are fertile. But we find also other plants, some in the woods, others in vineyards which we from their characters must conclude to be such spontaneous hybrids. ~~In some instances very~~ ~~[illegible]~~ in practice There is of course a great deal of judgment necessary to decide what may be considered a hybrid and what is only a variety of ~~two~~ some variable species, and the opinions of different persons may vary, but whoever has studied the great variability of many plants will hesitate long before he calls to his aid the often powerful help of hybridity in explaining the ~~appearance~~ of doubtful forms. Where species are so well marked as e.g. Labrusca is, it is not difficult to recognize ~~it at~~ some of its marks in hybrids though the general looks ~~appear~~ of the hybrid may otherwise not conform to our idea of Labrusca at all. But in other cases where species that are otherwise already very near one another the matter becomes somewhat more difficult. But there is one way, unfortunately a very tedious one, to ~~[illegible]~~ assist us in these investigations. It is the fact that seedlings of hybrids are apt to revert to or at least approach to one or the other of the parent species.

One of the best examples of ~~both~~ the positions I have taken here is furnished by the so called Taylor or Taylor-Bullitt Grape. Its glossy glabrous foliage and its vigorous growth and its small clusters of dark, but sprightly & pretty [illegible] all seem to point to it as a cultivated variety of Riparia (or as it was formerly called Cordifolia) and the true Riparia ~~[illegible]~~ are there, but when we examine its seedlings we find that they are [illegible] [illegible] sometimes producing (I have not only seen 6 in succession), and they differ [illegible] the seeds

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Hybr 2

~~form~~ vinifera, by their fruit size and form (see fig ~~fig~~ 3). Now, Taylor seeds have been planted by the millions in Europe, in order to raise resistant stock for grafting; and the general experience is that you can never find two seedlings alike in a hundred; a few approach the vinifera type and more ^show the labrusca ancestors. ~~[illegible]~~ These ^I give only one ^example of such seedlings, the now ~~[illegible]~~ frequently cultivated Elvira form is a Taylor seedling with a closer approach to Labrusca.

It would further the study of our grapevines considerably if those that have the zeal, the time and the space ~~[illegible]~~ ~~[illegible]~~ ~~seedlings~~ would undertake such experiments with seeds of many different forms; and I would suggest ~~[illegible]~~ among them those southern and other forms (Herbemont, etc. [illegible]) as the object of such experiments.

Where?

When ^different species grow together and bloom at the same period, they are more likely to hybridize, than such species that ~~are found in different parts of the [illegible]~~ separated geographically by wide distances or that flower at very different periods — ~~[illegible]~~ And with all these considerations we must not forget that with the innumerable opportunities given every where to hybridize we find comparatively few ^spontaneous ~~natural~~ hybrids in the vegetable world. Hybridization is an abnormal process, to which nature opposed certain obstacles. If it were not so, we would meet more hybrids in our woods and prairies than genuine species — but how rare are they, and what a job it is to discover one and this the more so [illegible] as the quantity [illegible] those ^really united in the same flowers are [illegible] so arranged that self fertilization is excluded. Thus Nature abhors hybridization!

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all! [illegible]

4 4 Resistance to Phylloxera

3 3 Fungus Diseases

2 2 Growth for cutting

1 1 ~~Hybrids~~ ~~for grafting~~

Leaves typically [illegible] [illegible]

8 cinerea E. Closely allied to the [illegible], [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] it is distinguished by the [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] or [illegible] glabrous [illegible] [illegible] with [illegible] [illegible] [illegible] (conical) the [illegible] small ([illegible]) [illegible] [illegible] [illegible] [illegible] [illegible]

This species is found in rich soil in [illegible] from Central [illegible] [illegible] lands, along streams or the banks of lakes, in bottom lands [illegible] It is very [illegible] [illegible] rarely [illegible]

9. V. cordifolia Michx. The tallest of our climbers in our State [illegible] bottom lands Cottonwoods, but also a common trailer [illegible] and hedges — well known as the winter or frost grape, (flav[illegible] black shining berries late for maturity late it strongly flavored [illegible] [illegible] The plant is glabrous or [illegible] branchlets [illegible] angular [illegible] short hairy [illegible] (within [illegible] petioles [illegible] than in the last species) [illegible] 3–6 in. wide [illegible] 3-lobed, [illegible] leaves cordate or rarely a deep narrow or wider and deep sinus with large toothed [illegible] but with sharp teeth acuminate

5th

a of [illegible] for St. Louis

Fig 28-30 Ditto [illegible] from [illegible] —

Fig 29 ~~in an opened pod~~ is one of the seeds found in a grapebag, found with an Egyptian Mummy, now in the Museum at Boston. — — — —

If the Mummy seed is remarkably thicker than all the modern American seeds, yet the changes not quite so high as [illegible], which might indicate a change of the seed, since the 2000 or more years intervening between ~~the Pharaos~~ [illegible] the old Egyptian and the ~~present~~ modern peoples of the old World

Cordifolia

stipules short; flowers in large clusters mostly of course opening rather late, berries black shining with small dark lines with a peculiarly disagreeable and strong flavor, ~~seeds~~ edible only after frost. Seeds with a strongly developed or rather slight raphe

~~This~~ A common plant from the middle States southward to Texas, not known, I believe, in Northern New York and New England, nor in northern Illinois or Wisconsin; but not rare about Philadelphia and ~~near~~ also observed New York city; very common in the deep bottomwoods of the western River banks, where it reaches its fullest development there the trunk reach the dimension of 30 to 38 inches circumference (South Missouri). Whether the trunk found at Darien, Georgia measuring 46 inch circumference found by Mr Ravenel belongs to this species I can not tell, but his supposition that it ~~[illegible]~~ was an [illegible] is entirely improbable; the statements of newspapers 69 ~~[illegible]~~ are stated in a newspaper article to have been the ~~circumference~~ around of a trunk of a grape in a Gulf Hammock in Florida — is strongly doubted by Florida botanists.

The species has a peculiar botanical interest because it has been often confounded with Vitis riparia and been considered a variety of it; but their whole resemblance consists in both having shining and usually glabrous leaves

see below ⌀ ~~The species was often~~ ~~confounded with~~ Vitis riparia of [illegible]

~~more [illegible]~~

10 Vitis rubra Michaux. This interesting plant was so doubtful to ~~its author~~ the botanist who discovered ~~and named it~~ more than 80 years ago on the banks of streams in Illinois, that he suppressed ~~the~~ his name in his published work and ranged ~~it~~ the plant with V. riparia. Mr H Eggert of St Louis rediscovered it last fall ~~opposite Alt~~ on the banks of the Mississippi opp. Alton, and visited collecting it ~~[illegible]~~ again this summer so that we now have its complete shown it proved the latest flowering of all our species

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when
history ~~and~~ can have no further doubt of its identity with Michaux's plant which I studied in his herbarium in Paris, and of its entire distinctness from V. riparia. It grows with this last one ~~and~~ covering willow thickets and other bushes in low grounds, overflowed in spring. Its bright red branches (and often even red petioles) among the ~~glabrous~~ smooth, but dull and rather dark (much darker than riparia) foliage, ~~[illegible]~~ show the one ~~[illegible]~~ how appropriate Michaux's name was ~~[illegible]~~. ~~diaphragm~~ has a thick diaphragm. The leaves are 3, rarely 5-lobed, the lobes shallow or often more frequently deep cut, and usually drawn out into long slender points; the lower side is often slightly hairy along the nerves. ~~Flowers~~ Flower bunches large and loose, long ~~peduncled~~ stemmed, ~~flowers~~ berries rather small (4-5 lines through) black without bloom, seeds 1 or 2 very large, plump, rounded, with very short beak, notched on top without a visible raphe.

~~The foliage resembles~~ Our plant is distinguished from riparia by its dull colored foliage, ~~the thick diaphragm in the branches~~ red its later period of flowering its bloomless berries; ~~and it~~ from cordifolia the form of the leaves and of the seeds decidedly separates it.

11 ~~Vitis Riparia~~ Michaux

(~~Cordifolia~~ ∅ the acute mostly narrow sinus of the leaves, the small ~~short~~ stipules, ~~the~~ the character of the seed and the late flowering time readily distinguish it, and the circumstance that it don't grow from cuttings)

11 V. riparia Mich. the Grape Vine of the River banks, has lately acquired a ~~great~~ deal of importance as it ~~is used now~~ has now become the principal Grape relied on in France for the renovation of their failing vineyards, for which its vigorous growth adapted to almost all climates, its perfect resistance to the Insect, and its ready growth from cuttings and grafts seem to fit it peculiarly.